

# Lesson 2-6

Objective – To prove conclusions involving geometric figures.

Hypothesis  
(Given)

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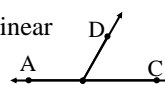
- Definitions
- Postulates
- Properties
- Theorems

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Conclusion

**Linear Pair Theorem** - If two angles form a linear pair, then they are supplementary.

Prove: If  $\angle ABD$  and  $\angle DBC$  form a linear pair, then they are supplementary.



Statement	Reasons
1) $\angle ABD$ & $\angle DBC$ form a linear pair.	Given
2) $\overline{BA}$ & $\overline{BC}$ form a straight line	Def. of linear pair
3) $m\angle ABC = 180^\circ$	Def. of straight angle
4) $m\angle ABD + m\angle DBC = m\angle ABC$	Angle Addition Post.
5) $m\angle ABD + m\angle DBC = 180^\circ$	Substitution (3 into 4)
6) $\angle ABD$ & $\angle DBC$ are suppl.	Def. of Suppl. Angles

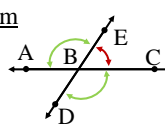
**Congruent Supplements - Theorem** If two angles are supplementary to the same angle, then they are congruent.

**Right Angle Congruence - Theorem** All right angles are congruent.

**Congruent Complements - Theorem** If two angles are complementary to the same angle, then they are congruent.

**Congruent Supplements Theorem**

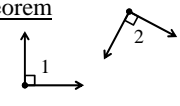
Prove: If  $\angle ABE$  &  $\angle EBC$  are suppl. &  $\angle EBC$  &  $\angle DBC$  are suppl., then  $\angle ABE \cong \angle DBC$ .



Statement	Reasons
1) $\angle ABE$ & $\angle EBC$ are suppl. $\angle EBC$ & $\angle DBC$ are suppl.	Given
2) $m\angle ABE + m\angle EBC = 180^\circ$ $m\angle EBC + m\angle DBC = 180^\circ$	Def. of suppl. angles
3) $m\angle ABE + m\angle EBC = m\angle EBC + m\angle DBC$	Substitution (2 into 2)
4) $m\angle EBC = m\angle EBC$	Reflexive Property
5) $m\angle ABE = m\angle DBC$	Subtract Prop of Equal.
6) $\angle ABE \cong \angle DBC$	Def. of $\cong$ $\angle$ s

**Right Angle Congruence Theorem**

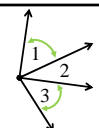
Prove: If  $\angle 1$  is a rt. angle &  $\angle 2$  is a rt. angle, then  $\angle 1 \cong \angle 2$ .



Statement	Reasons
1) $\angle 1$ & $\angle 2$ are right angles.	Given
2) $m\angle 1 = 90^\circ$ $m\angle 2 = 90^\circ$	Def. of right angles
3) $m\angle 1 = m\angle 2$	Substitution (2 into 2)
4) $\angle 1 \cong \angle 2$	Def. of $\cong$ $\angle$ s

**Congruent Complements Theorem**

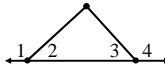
Prove: If  $\angle 1$  &  $\angle 2$  are compl. &  $\angle 2$  &  $\angle 3$  are compl., then  $\angle 1 \cong \angle 3$ .



Statement	Reasons
1) $\angle 1$ & $\angle 2$ are compl. $\angle 2$ & $\angle 3$ are compl.	Given
2) $m\angle 1 + m\angle 2 = 90^\circ$ $m\angle 2 + m\angle 3 = 90^\circ$	Def. of compl. angles
3) $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	Substitution (2 into 2)
4) $m\angle 1 = m\angle 3$	Reflexive Property
5) $\angle 1 = \angle 3$	Subtract Prop of Equal.
6) $\angle 1 \cong \angle 3$	Def. of $\cong$ $\angle$ s

## Lesson 2-6

Prove: If  $\angle 2 \cong \angle 3$ , then  $\angle 1 \cong \angle 4$ .



Statement	Reasons
1) $\angle 2 \cong \angle 3$	Given
2) $\angle 1$ & $\angle 2$ are linear pair. $\angle 3$ & $\angle 4$ are linear pair.	Def. of linear pair
3) $\angle 1$ & $\angle 2$ are suppl. $\angle 3$ & $\angle 4$ are suppl.	Linear Pair Theorem
4) $m\angle 1 + m\angle 2 = 180^\circ$ $m\angle 3 + m\angle 4 = 180^\circ$	Def of Suppl. Angles
5) $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	Substitution (4 into 4)
6) $m\angle 2 = m\angle 3$	Def. of $\cong \angle$ s
7) $m\angle 1 = m\angle 4$	Subtract Prop of Equal.
8) $\angle 1 \cong \angle 4$	Def. of $\cong \angle$ s